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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/882,046	06/18/2001	Marcos C. Tzannes	081513-77	1382

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MILES & STOCKBRIDGE PC  
1751 PINNACLE DRIVE  
SUITE 500  
MCLEAN, VA 22102-3833

EXAMINER
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TORRES, JOSEPH D

ART UNIT	PAPER NUMBER
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2133

DATE MAILED: 11/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/882,046

Applicant(s)

TZANNES ET AL.

Examiner

Joseph D. Torres

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 August 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-35 and 37 is/are pending in the application.
- 4a) Of the above claim(s) 13-35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-12 and 37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

**DETAILED ACTION**

***Information Disclosure Statement***

1. The information disclosure statement filed 08/30/2004 fails to comply with 37 CFR 1.98(a)(1), which requires a list of all patents, publications, or other information submitted for consideration by the Office. It has been placed in the application file, but the information referred to therein has not been considered. Note: a PTO-1449 has not been included along with the G.992.1 standard document filed 08/30/2004. The Examiner asserts that the Applicants have agreed to disclose to the United States Patent and Trademark Office all information known to the Applicants to be material to patentability as defined in 37 CFR 1.56, including material information which became available between the filing date of the prior application and the National or PCT-International filing date of the continuation-in-part application. A PTO-1449 form is required for the G.992.1 standard document filed 08/30/2004.

***Oath/Declaration***

2. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

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It does not identify the city and either state or foreign country of residence of each inventor. The residence information may be provided on either on an application data sheet or supplemental oath or declaration.

Note: the Application Data Sheet filed 06/18/2001 includes a postal address but does not not identify the city and either state or foreign country of residence of each inventor.

### ***Election/Restrictions***

3. Applicant's election without traverse of claims 1-12 in the reply filed on 08/30/2004 is acknowledged.

This application contains claims 13-35 drawn to an invention nonelected with traverse in Paper No. 6. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

### ***Drawings***

4. In view of Applicant Arguments or Remarks Made in an Amendment filed 08/30/2004, the Examiner approves proposed drawing corrections and will withdraw all objections to the drawings upon receipt of the correct drawings. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

***Response to Arguments***

5. Applicant's arguments filed 08/30/2004 have been fully considered but they are not persuasive.

The Applicant contends, "The Office Action objects to claims 1-12 and rejects the same due to an apparent misunderstanding of the term 'coset.' At least based on the attached ITU standard for 6.992.1, Applicants respectfully submit the term coset is a well-known and commonly used term in the communications art. In particular, section 7.8.3 of the G.992.1 standard specifically states "in a trellis code modulation system, the expanded constellation is labeled and partitioned into subsets ('cosets') using a technique called mapping by set-partitioning".

The Examiner would like to point out that the excerpt from the ITU standard for 6.992.1 does not provide a definition for coset but appears to be using coset interchangeably with the word subset (Note: examples of usage do not comprise a definition). In addition, although, the Applicant has presented an excerpt from the ITU standard for 6.992.1 that provides an example of a usage for coset (subset), the Applicant has made no attempt to present a definition for coset. The Examiner requests that the Applicant either confirm that the Applicant is using coset interchangeably with subset or to provide a definition with support from the Applicant's specification for the particular interpretation. The Examiner would also like to point out that the closest definition that

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the Applicant has provided for coset in paragraph [0003] on page 1 is consistent with the excerpt from the ITU standard for 6.992.1 that the Applicant has provided.

The Applicant contends, "Accordingly, Applicants respectfully submit that claim 3 is fully in compliance with 35 U.S.C. 112". The Examiner asserts that claim 3 recites, "the LDPC code has an equal BER for one or more information bits and one or more parity bits". As the Applicant has pointed out BER stands for bit error rate which is calculated from a group of bits over a period of time. First of all, it is not clear if the BER claimed in claim 3 refers to the bit Error rate of the LDPC code or some subset of the LDPC code. The Examiner is can only assume it is the BER for the LDPC code. It is not clear from the plain English language in claim 3 what is being compared or is it clear what is meant by equal BER since there is only one BER for a code.

The Applicant contends, "Claim 1 recites, inter alias, FEC coding a subset of the data bit signals using an LDPC code to produce FEC coded bit signals, modulating the data bit signals and the FEC coded bit signals using at least one constellation that contains more than one bit signal and designating a coset of the at least one constellation using the FEC coded bit signals. At no point does Haruhiko teach or suggest the steps as claimed".

Asada teaches a method of combined modulation (Step 850 in Figure 8 in Asada) and Forward Error Correction, FEC coding (Step 810 in Figure 8 in Asada; Note: Columns 7 and 8 in Asada teach that Figure is a method of combined modulation and Forward

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Error Correction), of data bit signals for transmission over a communications channel (Figure 8 in Asada teaches a method of combined modulation and Forward Error Correction, FEC coding, of data bit signals for transmission over a communications channel) comprising: FEC coding a subset of the data bit signals using an LDPC code to produce FEC coded bit signals (col. 7, lines 17-19 in Asada teach that error correction parity is added to blocks of message bits; Note: blocks of message bits are subset blocks of the data bit message signals; col. 8, lines 7-11 in Asada teach that Figure 8 is applicable to LDPC codes); modulating the data bit signals and the FEC coded bit signals using at least one constellation that contains more than one bit signal (Step 850 in Figure 8 in Asada is a modulation step for modulating the data bit signals and the FEC coded bit signals; col. 9, lines 48-50 in Asada teach block-coded modulation schemes create codeword arrays where the columns of the arrays are mapped to signal points from a signal constellation as in Figure 11 of Asada); and designating a coset of the at least one constellation using the FEC coded bit signals (the codeword array in Figure 11 of Asada is mapped into a constellation by mapping each column which is a subset of the matrix onto the constellation, hence each column is a "coset").

The Examiner disagrees with the applicant and maintains all rejections of claims 1-12. All amendments and arguments by the applicant have been considered. It is the Examiner's conclusion that claims 1-12 are not patentably distinct or non-obvious over the prior art of record in view of the reference, Asada; Haruhiko H. et al. (US 6553535

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B1, hereafter referred to as Asada) and the Applicant's admitted Prior Art as applied in the last office action, filed 03/29/2004. Therefore, the rejection is maintained.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Newly amended claims 11 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. Claim 11 recites, "a parity check matrix of the LDPC code represents an equal number of branches connecting at least one information bit and at least one parity bit with at least one parity node". The omitted structural cooperative relationships are: the relationships that allow "a parity check matrix" to represent "equal number of branches connecting at least one information bit and at least one parity bit with at least one parity node".

Claim 12 recites, "a parity check matrix represents at least one parity node connected to an equal number of information bits and parity bits." The omitted structural cooperative relationships are: the relationships that allow "a parity check matrix" to represent "at least one parity node connected to an equal number of information bits and parity bits".



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6. Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

See the Non-Final Action filed 03/29/2004 for detailed action of prior rejections.

Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections.

See the Non-Final Action filed 03/29/2004 for detailed action of prior rejections.

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections.

See the Non-Final Action filed 03/29/2004 for detailed action of prior rejections.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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7. Claims 1-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Asada; Haruhiko H. et al. (US 6553535 B1, hereafter referred to as Asada).

See the Non-Final Action filed 03/29/2004 for detailed action of prior rejections.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Asada; Haruhiko H. et al. (US 6553535 B1, hereafter referred to as Asada) in view of Applicant's admitted Prior Art.

See the Non-Final Action filed 03/29/2004 for detailed action of prior rejections.

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9. Newly added claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Asada; Haruhiko H. et al. (US 6553535 B1, hereafter referred to as Asada) in view of Murphy; John L. et al. (US 5278844 A, hereafter referred to as Murphy).

35 U.S.C. 103(a) rejection of claim 37.

Asada substantially teaches the claimed invention described in claims 1-10 (as rejected above).

However Asada does not explicitly teach the specific use of modulation being multicarrier modulation.

Murphy, in an analogous art, teaches use of modulation being multicarrier modulation (see Abstract, Murphy).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Asada with the teachings of Murphy by including use of modulation being multicarrier modulation. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of modulation being multicarrier modulation would have provided the opportunity to correct errors in a multicarrier signal.

### ***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Torres whose telephone number is (571) 272-3829. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Joseph D. Torres, PhD  
Primary Examiner  
Art Unit 2133

